Management and Inequality

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Management and Inequality

- Management is correlated with firm performance:
  - Bloom, Brynjolfsson, Foster, Jarmin, Patnaik, Saporta and Van Reenen (2013, 2019)
  - Find positive correlation between set of management practices and size, productivity, profitability, survivorship, etc.

- This paper: How is management related to inequality?

Management and Inequality

- How is management related to inequality?
  - More structured management could lead to rewarding high-performers over others, therefore leading to a rise in inequality inside of the firm.
  - More structured management could lead to keeping only high-performers (more efficient workers), therefore leading to a decrease in inequality inside of the firm.

- Empirical Question: What is the relationship between management and within-firm inequality?

Management and Inequality

- Why understanding within-firm inequality is important?
  - Within-firm wage dispersion accounts for approximately 2/3 of all wage inequality (Song et. al, 2018)
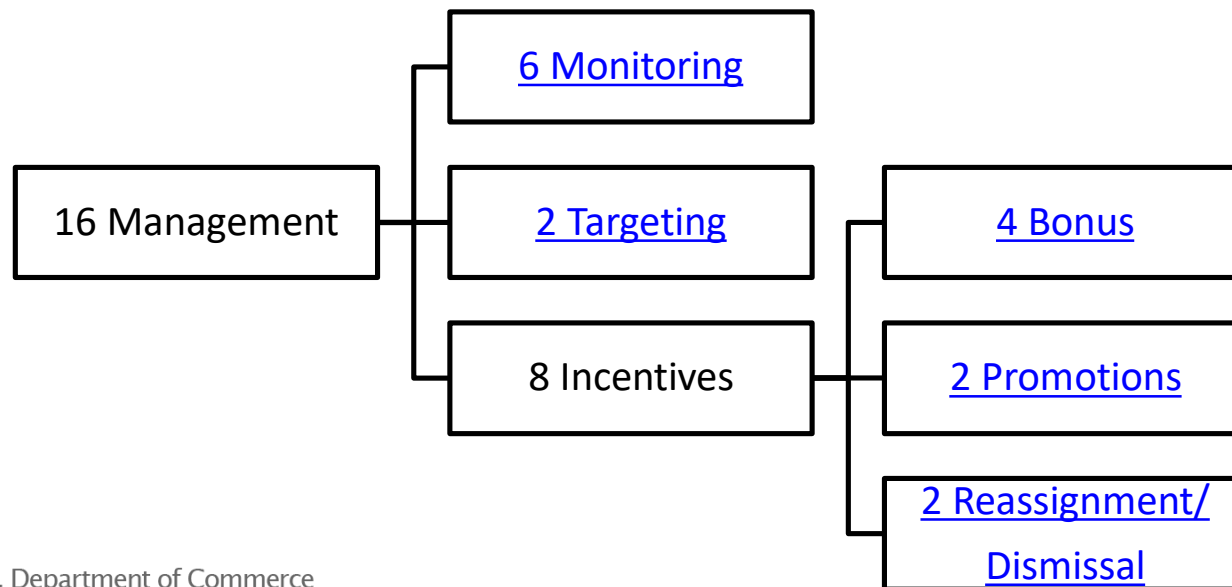
This Talk

- Data Background

- Management and Inequality

  Decomposing Management

- Ongoing work and Conclusion

Management and Organizational Practices Survey (MOPS)

- Content developed by U.S. Census Bureau in partnership with Bloom, Brynjolfsson, and Van Reenen

- Supplement to the Annual Survey of Manufactures

- Two waves of 35,000 manufacturing plants in <u>2010</u> and 2015.

- 16 questions on structured management practices:
    - Practices related to performance monitoring, target-setting, and performance incentives
    - We refer to more explicit, formal or frequent applications of these practices as *more structured practices*

Management Score

- Each response to each question is assigned a value between 0 (least structured) and 1 (most structured) following Bloom et al. (2019)

- Management score is the simple mean of the scores for all 16 questions

```
16 Management ──┬── 6 Monitoring
                │
                ├── 2 Targeting
                │
                └── 8 Incentives ──┬── 4 Bonus
                                   │
                                   ├── 2 Promotions
                                   │
                                   └── 2 Reassignment/
                                       Dismissal
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Longitudinal Employer-Household Dynamics (LEHD)

- Linked employer-employee administrative data

  Quarterly wages for all workers according to state unemployment insurance records.

  Covers around 96% of all employment in the U.S.

- We require:
  - Quarterly earnings equivalent of at least full-time federal minimum wage in 6 quarters: 2009Q4-2011Q1
  - Employment at an establishment in the manufacturing sector
  - Grouped at the *firm-state* level

    Require at least 20 employees at the firm-state

LEHD & MOPS

- Use LEHD to construct measures of wage dispersion
  - Log(90th/10th), Log(90th/50th), Log(50th/10th), differences in log annual wages at the firm-state level

- Aggregate the ASM & MOPS to the firm-state level
  - Sum of shipments, employment, etc. for all establishments in the firm-state from the ASM
  - Employment-weighted mean of management scores for all establishments at the firm-state in the MOPS

- Match to LEHD at the firm-state level

Descriptive Statistics

	Mean	Standard Deviation	25th Percentile	75th Percentile
Log(90th Percentile) - Log(10th Percentile)	0.975	0.305	0.761	1.152
Log(90th Percentile) - Log(50th Percentile)	0.617	0.244	0.446	0.748
Log(50th Percentile) - Log(10th Percentile)	0.359	0.141	0.257	0.439
Average Variance in Log(Quarterly Worker Earnings)	0.033	0.032		
Management Score	0.658	0.136	0.581	0.757
Monitoring & Targeting Score	0.698	0.153	0.604	0.813
Incentives Score	0.607	0.185	0.500	0.739
Bonuses Score	0.413	0.285		
Promotions Score	0.858	0.257		
Reassignment/Dismissal Score	0.632	0.347		
Log(Emp)	4.882	1.065		

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- Management and Worker Wage Variation

- Conclusion

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90-10 Earnings Differential is Decreasing in Structured Management

Earnings Dispersion is Negatively Correlated with Structured Management

Dependent Variable	Log(90th Percentile) - Log(10th Percentile)		
	(1)	(2)	(3)
Management	-0.1447***	-0.1066***	-0.057***
	(0.0185)	(0.0192)	(0.019)
Log(Emp)		-0.0312***	-0.013***
		(0.0026)	(0.003)
Log(Capital/Emp)		-0.0207***	-0.016***
		(0.0032)	(0.003)
Log(VA/Emp)		0.0084**	0.015***
		(0.0038)	(0.004)
Share of Employees w/ a Bachelor's Degree		0.2027***	0.201***
		(0.0203)	(0.020)
Firm Age			0.001
			(0.000)
Log(Firm Employment)			-0.022***
			(0.002)
Observations (Firm-State)	17,000	17,000	17,000
Number of Firms (Clusters)	11,000	11,000	11,000
Fixed Effects	Industry, State	Industry, State	Industry, State

One s.d. change in the management score is associated with 0.7%-2% decrease in the 90-10

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Earnings Dispersion is Negatively Correlated with Structured Monitoring, Positively Correlated with Structured Incentives

Dependent Variable	Log(90th Percentile) - Log(10th Percentile)	
	(1)	(2)
Monitoring & Targeting	-0.146***	-0.143***
	(0.018)	(0.018)
Incentives	0.049***	
	(0.014)	
Bonuses		0.035***
		(0.009)
Promotions		-0.018*
		(0.010)
Reassignment/Dismissal		0.020***
		(0.007)
Log(Emp)	-0.012***	-0.011***
	(0.003)	(0.003)
Log(Capital/Emp)	-0.014***	-0.014***
	(0.003)	(0.003)
Log(VA/Emp)	0.015***	0.014***
	(0.004)	(0.004)
Share of Employees w/ a Bachelor's Degree	0.203***	0.202***
	(0.020)	(0.020)
Firm Age	0.001*	0.001*
	(0.000)	(0.000)
Log(Firm Employment)	-0.020***	-0.020***
	(0.002)	(0.002)
Observations (Firm-State)	17,000	17,000
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Fixed Effects	Industry, State	Industry, State

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Earnings Dispersion is Negatively Correlated with Structured Monitoring, Positively Correlated with Structured Incentives

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Results still hold when controlling for AKM firm-state and average worker fixed effects OR when controlling for specific workers characteristics: female share in firm, share of emp by educational level, share of emp by age, mean employment spell duration, etc.

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Coming soon

- Adding non-manufacturing establishments to our analysis (i.e. Professional Services /Management of companies):
    - 90-10 Inequality increases
    - Negative effect of the overall management score (weaker).
    - Offsetting effects: Strong negative effect of monitoring/targeting but positive effect on incentives (bonuses).
- Pooled 2010-2015: Strong and significant results

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Conclusions

- Structured management is associated with lower within-firm inequality

    - Magnitudes of overall relationship are moderate

    - Offsetting effects:

        - More structured monitoring is correlated with less inequality

        - More structured incentives (particularly bonuses) are correlated with more inequality

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Performance and Inequality

Dependent Variable	Log(90th Percentile) - Log(10th Percentile)			
	(1)	(2)	(3)	(4)
Log(Firm Employment)	-0.027***			
	(0.002)			
Log(Shipments/Emp)		-0.011***		
		(0.004)		
Log(Profit/Shipments)			-0.024***	
			(0.007)	
Largest Plant TFP				-0.000
				(0.006)
Observations (Firm-State)	17,000	17,000	17,000	17,000
Number of Firms (Clusters)	11,000	11,000	11,000	11,000
Fixed Effects	Industry, State	Industry, State	Industry, State	Industry, State

Performance and Inequality

Dependent Variable	Log(90th Percentile) - Log(10th Percentile)
Log(Firm Employment)	-0.014***
	(0.003)
Log(Emp)	-0.022***
	(0.002)
Average Annual Employment	-0.034***
Growth, 2005-2010 (Winsorized)	(0.011)
Log(Capital/Emp)	-0.013***
	(0.003)
Share of Employees w/ a	0.201***
Bachelor's Degree	(0.020)
Firm Age	0.000
	(0.000)
Observations (Firm-State)	17,000
Number of Firms (Clusters)	11,000
Fixed Effects	Industry, State

4th Quarter Wage Spikes are Positively Correlated with Structured Bonus Practices

Dependent Variable	Firm-State Mean of (Log Q4 Earnings - Average Log Earnings for Q1-Q3)		
	(1)	(2)	(3)
Management	0.020**		
	(0.008)		
Monitoring & Targeting		-0.021***	-0.019**
		(0.008)	(0.007)
Incentives		0.028***	
		(0.006)	
Bonuses			0.031***
			(0.004)
Promotions			-0.003
			(0.004)
Reassignment/Dismissal			-0.003
			(0.003)
Log(Emp)	-0.002**	-0.002*	-0.002
	(0.001)	(0.001)	(0.001)
Log(Capital/Emp)	-0.004***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)
Log(VA/Emp)	0.007***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)
Share of Employees w/ a Bachelor's Degree	-0.009	-0.008	-0.010
	(0.009)	(0.009)	(0.009)
Firm Age	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Log(Firm Employment)	-0.008***	-0.007***	-0.007***
	(0.001)	(0.001)	(0.001)
Observations (Firm-State)	17,000	17,000	17,000
Number of Firms (Clusters)	11,000	11,000	11,000
Fixed Effects	Industry, State	Industry, State	Industry, State

Wages are Increasing in Management Score
Particularly at the Bottom of the Firm-State's Wage Distribution
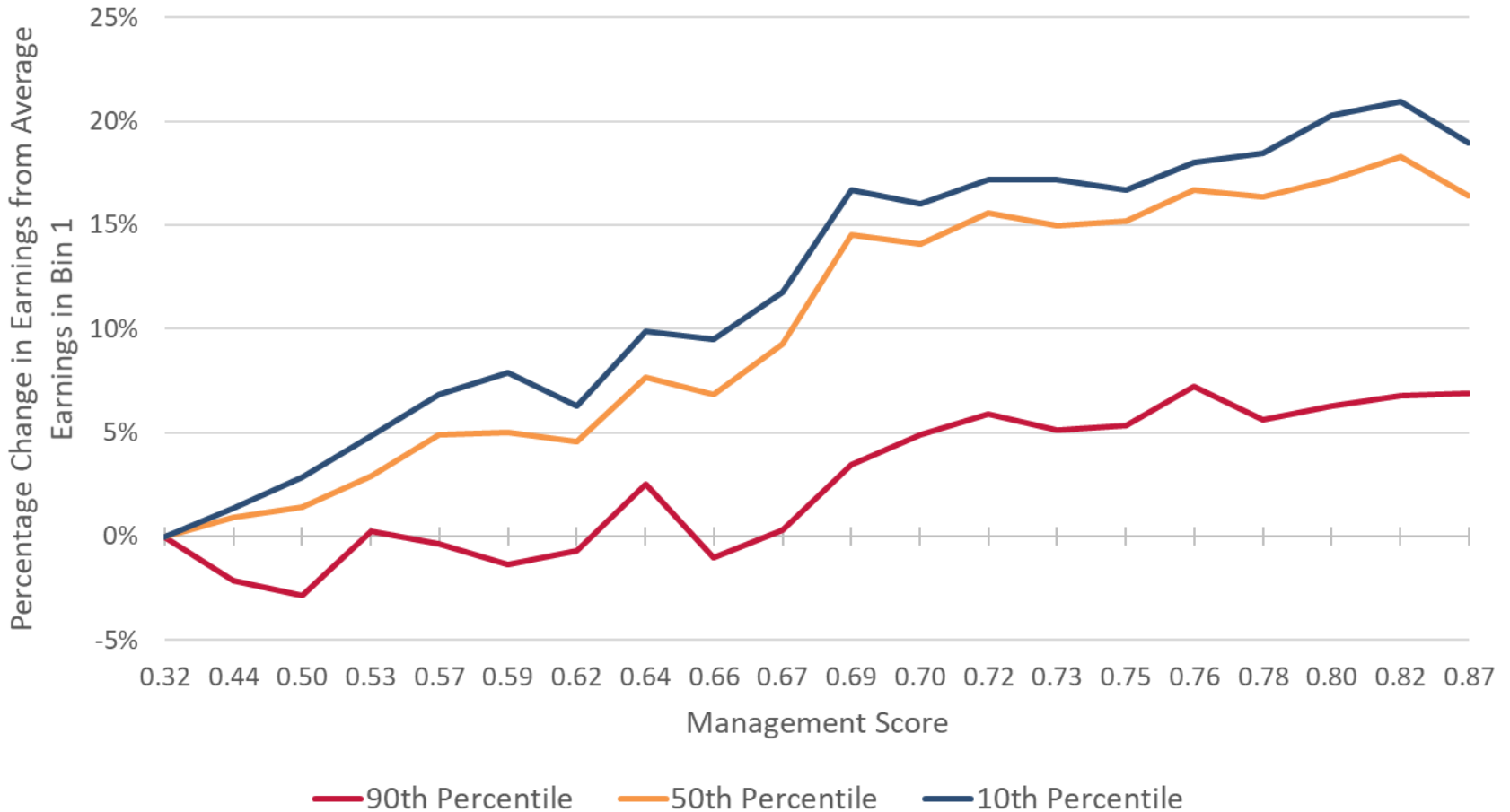
Monitoring Question Examples

Section A - Management Practices

1 In 2005 and 2010, what best describes what happened at this establishment when a problem in the production process arose?

Examples: Finding a quality defect in a product or a piece of machinery breaking down.

Check one box for each year	2005	2010
We fixed it but did not take further action	☐	☐
We fixed it and took action to make sure that it did not happen again	☐	☐
We fixed it and took action to make sure that it did not happen again, and had a continuous improvement process to anticipate problems like these in advance	☐	☐
No action was taken	☐	☐

2 In 2005 and 2010, how many key performance indicators were monitored at this establishment?

Examples: Metrics on production, cost, waste, quality, inventory, energy, absenteeism and deliveries on time.

Check one box for each year	2005	2010
1-2 key performance indicators	☐	☐
3-9 key performance indicators	☐	☐
10 or more key performance indicators	☐	☐
No key performance indicators (If no key performance indicators in both years, SKIP to ❻)	☐	☐

3 During 2005 and 2010, how frequently were the key performance indicators **reviewed** by **managers** at this establishment? **Mark all that apply**

A manager is someone who has employees directly reporting to them, with whom they meet on a regular basis, and whose pay and promotion they may be involved with, e.g., Plant Manager, Human Resource Manager, Quality Manager.

	2005	2010
Yearly	☐	☐
Quarterly	☐	☐
Monthly	☐	☐
Weekly	☐	☐
Daily	☐	☐
Hourly or more frequently	☐	☐
Never	☐	☐

Targeting Question Examples

6 In 2005 and 2010, what best describes the time frame of production targets at this establishment?

Check one box for each year

Examples of production targets are: production, quality, efficiency, waste, on-time delivery.

	2005	2010
Main focus was on short-term (less than one year) production targets	☐	☐
Main focus was on long-term (more than one year) production targets	☐	☐
Combination of short-term and long-term production targets	☐	☐
No production targets (If no production targets in both years, SKIP to **13**)	☐	☐

8 In 2005 and 2010, who was aware of the production targets at this establishment? *Check one box for each year*

	2005	2010
Only senior managers	☐	☐
Most managers and some production workers	☐	☐
Most managers and most production workers	☐	☐
All managers and most production workers	☐	☐

Bonus Question Examples

9 In 2005 and 2010, what were **non-managers'** performance bonuses usually based on? *Mark all that apply*

	2005	2010
Their own performance as measured by production targets	☐	☐
Their team or shift performance as measured by production targets	☐	☐
Their establishment's performance as measured by production targets	☐	☐
Their company's performance as measured by production targets	☐	☐
No performance bonuses (If no performance bonuses in both years, SKIP to **11**)	☐	☐

10 In 2005 and 2010, when production targets were met, what percent of **non-managers** at this establishment received performance bonuses? *Check one box for each year*

	2005	2010
0%	☐	☐
1-33%	☐	☐
34-66%	☐	☐
67-99%	☐	☐
100%	☐	☐
Production targets not met	☐	☐

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Promotion Questions

13 In 2005 and 2010, what was the primary way **non-managers** were promoted at this establishment?

Check one box for each year	2005	2010
Promotions were based solely on performance and ability	☐	☐
Promotions were based partly on performance and ability, and partly on other factors (for example, tenure or family connections)	☐	☐
Promotions were based mainly on factors other than performance and ability (for example, tenure or family connections)	☐	☐
Non-managers are normally not promoted	☐	☐

14 In 2005 and 2010, what was the primary way **managers** were promoted at this establishment?

Check one box for each year	2005	2010
Promotions were based solely on performance and ability	☐	☐
Promotions were based partly on performance and ability, and partly on other factors (for example, tenure or family connections)	☐	☐
Promotions were based mainly on factors other than performance and ability (for example, tenure or family connections)	☐	☐
Managers are normally not promoted	☐	☐

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Return

Reassignment & Dismissal Question Example

15 In 2005 and 2010, when was an under-performing **non-manager** reassigned or dismissed? *Check one box for each year*

	2005	2010
Within 6 months of identifying non-manager under-performance	☐	☐
After 6 months of identifying non-manager under-performance	☐	☐
Rarely or never	☐	☐

Establishment-Level Results from Bloom et al. (2013)

Dependent Variable	Log(VA/Emp)		Log(Profit/ Shipments)
	(1)	(2)	(3)
Management	1.272***	0.498***	0.058***
	(0.05)	(0.037)	(0.01)
Log(Emp)		-0.035***	0.001
		(0.006)	(0.002)
Log(Capital/Emp)		0.179***	0.01***
		(0.007)	(0.002)
Share of Employees w/ a Bachelor's Degree		0.418***	0.004
		(0.041)	(0.011)
Observations (Firm-State)	32,000	32,000	32,000
Number of Firms (Clusters)	18,000	18,000	18,000
Fixed Effects	None	Industry	Industry

Quarterly Wage Variation

How are structured management practices correlated with worker-level wage variation?

- Do structured management practices make for more (or less) consistent wages over the course of the year?

- Regress quarterly wage variation on structured management

    Quarterly wages are noisy – different number of pay periods per quarter

Quarterly Wage Variation for Workers is Negatively Correlated with Structured Monitoring, Positively Correlated with Structured Incentives

Dependent Variable	Average Variance in Log(Quarterly Worker Earnings)		
	(1)	(2)	(3)
Management	0.005**		
	(0.002)		
Monitoring & Targeting		-0.012***	-0.011***
		(0.002)	(0.002)
Incentives		0.011***	
		(0.001)	
Bonuses			0.015***
			(0.001)
Promotions			-0.004***
			(0.002)
Reassignment/Dismissal			-0.001
			(0.001)
Log(Emp)	0.000	0.000*	0.001***
	(0.000)	(0.000)	(0.000)
Log(Capital/Emp)	0.001*	0.001**	0.001**
	(0.000)	(0.000)	(0.000)
Log(VA/Emp)	0.005***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)
Share of Employees w/ a Bachelor's Degree	0.007**	0.007***	0.006**
	(0.003)	(0.003)	(0.003)
Firm Age	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Log(Firm Employment)	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)
Observations (Firm-State)	17,000	17,000	17,000
Number of Firms (Clusters)	11,000	11,000	11,000
Fixed Effects	Industry, State	Industry, State	Industry, State

Quarterly Wage Variation (2009-2011) for Workers is Negatively Correlated with Structured Monitoring, Positively Correlated with Structured Incentives

Dependent Variable	Average Variance in Log(Quarterly Worker Earnings)		
	(1)	(2)	(3)
Management	0.007***		
	(0.002)		
Monitoring & Targeting		-0.010***	-0.009***
		(0.002)	(0.002)
Incentives		0.012***	
		(0.001)	
Bonuses			0.013***
			(0.001)
Promotions			-0.003**
			(0.001)
Reassignment/Dismissal			-0.000
			(0.001)
Log(Emp)	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Log(Capital/Emp)	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Log(VA/Emp)	0.005***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)
Share of Employees w/ a Bachelor's Degree	0.005**	0.005**	0.005**
	(0.002)	(0.002)	(0.002)
Firm Age	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Log(Firm Employment)	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)
Observations (Firm-State)	14,500	14,500	14,500
Number of Firms (Clusters)	10,000	10,000	10,000
Fixed Effects	Industry, State	Industry, State	Industry, State